

PSITTACOSIS CONTROL GUIDELINES for Local Health Departments

Background

Psittacosis is the term used for human infection with *Chlamydophila psittaci* (formerly *Chlamydia psittaci*). The disease is also referred to as avian chlamydiosis, ornithosis or parrot fever and is primarily a disease of birds that incidentally affects people. Previous illness does not confer immunity on either birds or humans. Although psittacine birds like parrots and parakeets are most often affected, poultry and other non-psittacine birds can also be infected. Some strains are more likely to cause disease in birds and humans and some are less pathogenic. For more complete and up to date information, please see the most recent edition of the "Compendium of Measures to Control *Chlamydophila psittaci* (formerly *Chlamydia psittaci*) Infection Among Humans (Psittacosis) and Pet Birds" from the National Association of State Public Health Veterinarians. It can be found at <http://www.nasphv.org/Documents/Psittacosis.pdf>

Source of Human Disease

Humans become infected by inhaling the agent from aerosolized fresh feces, dusts from dried bird droppings, or nasal discharges of infected birds. Transmission from person to person has been suggested, but not proven. Because birds do not always show signs of illness when they are shedding organisms, it is possible to become infected from an apparently healthy bird. Shedding may be intermittent and is exacerbated by stress from such things as shipping, crowding, chilling, or breeding. Infected sick birds excrete high concentrations of *C. psittaci* organisms in their feces, and if not properly treated, constitute the greatest hazard to other birds and to their human contacts. Pet psittacine birds in aviaries, pet shops and homes are the most likely to infect humans. Ducks, geese, and pigeons are occasionally responsible for human disease. Large outbreaks of human disease have been associated with turkey processing plants. In 1984 an outbreak in a Virginia turkey processing plant resulted in 71 cases; usually less than 2 cases per year are reported in Virginia. Mammals can also occasionally transmit chlamydial species to humans.

Human Clinical Presentation and Treatment

The onset of disease usually follows an incubation period of 5-14 days, which can be longer. Severity ranges from inapparent to systemic illness with severe pneumonia. Symptoms typically include abrupt onset of fever, chills, headache, malaise and myalgia. A nonproductive cough usually develops and can be accompanied by breathing difficulty and chest tightness. A pulse-temperature dissociation (fever without elevated pulse), enlarged spleen, and nonspecific rash are sometimes observed. *C. psittaci* can affect organ systems other than the respiratory tract and result in different symptoms depending on the organ involved. Severe illness with respiratory failure, thrombocytopenia, hepatitis and fetal death has been reported among pregnant women.

Antibiotics of the tetracycline group, continued for 10-14 days after the temperature returns to normal, are the treatment of choice. Macrolides are probably the best alternative when tetracycline is contraindicated (children < 8 years and pregnant women).

Human Case Definitions

In 1997, CDC and the Council of State and Territorial Epidemiologists established surveillance case definitions for confirmed and probable psittacosis for epidemiologic purposes (4). These definitions should not be used as the sole criteria for establishing clinical diagnoses. For surveillance purposes, a patient is considered to have a confirmed case of psittacosis if clinical illness is compatible with psittacosis and the case is laboratory confirmed by one of three methods: a) *C. psittaci* is cultured from respiratory secretions; b) antibody against *C. psittaci* is increased by fourfold or greater (to a reciprocal titer of 32 between paired acute- and convalescent-phase serum specimens collected at least 2 weeks apart) as demonstrated by complement fixation (CF) or microimmunofluorescence (MIF); or c) immunoglobulin M antibody is detected against *C. psittaci* by MIF (to a reciprocal titer of 16).

A patient is considered to have a probable case of psittacosis if clinical illness is compatible with psittacosis and a) the patient is epidemiologically linked to a confirmed human case of psittacosis or b) a single antibody titer of 32, demonstrated by CF or MIF, is present in at least one serum specimen obtained after onset of symptoms. See (<http://www.cdc.gov/epo/dphsi/casedef/psittacosiscurrent.htm>) for current definitions.

Human Diagnosis

Most diagnoses are established by using microimmunofluorescence (MIF) to test for antibodies to *C. psittaci* in paired sera. MIF is more sensitive and specific than the previously used complement fixation (CF) tests; however there is still some cross-reactivity with other chlamydia, such as *C. pneumoniae*, *C. trachomatis* and *C. felis*. Certain polymerase chain reaction (PCR) assays can be used to distinguish *C. psittaci* infection from infection with other chlamydial species. Acute-phase serum specimens should be obtained as soon as possible after onset of symptoms, and convalescent-phase serum specimens should be obtained 2 weeks after the first specimen. Because antibiotic treatment can delay or diminish the antibody response, a third serum sample might help confirm the diagnosis. All sera should be tested simultaneously at the same laboratory. The infectious agent can also be isolated from the patient's sputum, pleural fluid, or clotted blood during acute illness and before treatment with antimicrobial agents; however, culture of *C. psittaci* is performed by few laboratories because of technical difficulty and safety concerns.

Information about laboratory testing is available at the Virginia state public health laboratory, the Division of Consolidated Laboratory Services (DCLS). Only a few commercial laboratories have the capability to differentiate chlamydial species. A list of laboratories which accept human specimens to confirm *C. psittaci* infection is provided in the compendium referenced in the opening paragraph of this document. In outbreak situations, it may be possible to make special arrangements for testing at the Centers for Disease Control via consultation with the Virginia Department of Health and DCLS.

Avian Transmission, Clinical Presentation and Treatment

Transmission between birds occurs most frequently by inhalation or ingestion of nasal secretions or feces. The signs of chlamydiosis in birds vary with the species of bird, the virulence of the strain of *Chlamydia*, stresses on the bird and the route of exposure. There are no pathognomonic signs or lesions. It is a systemic disease with signs that include lethargy, ruffled feathers, anorexia, and a serous or purulent ocular and/or nasal

discharge. If diarrhea occurs, the urates are often stained green to yellow-green. If death does not occur, the signs may subside after a prolonged period of weakness and debilitation. Rarely, the first sign of illness is sudden death.

If at all possible, treatment should be supervised by a licensed veterinarian who is experienced in avian medicine. See Appendix B of Compendium referenced in first paragraph for treatment options.

Avian Case Definitions

A confirmed case of avian chlamydiosis is defined on the basis of at least one of the following laboratory results: a) isolation of *C. psittaci* from a clinical specimen, b) identification of chlamydial antigen by immunofluorescence (fluorescent antibody [FA]) of the bird's tissues, c) a greater than fourfold change in serologic titer in two specimens from the bird obtained at least 2 weeks apart and assayed simultaneously at the same laboratory, or d) identification of *Chlamydiaceae* within macrophages in smears stained with Gimenez or Macchiavellos stain or sections of the bird's tissues.

A probable case of avian chlamydiosis is defined as compatible illness and at least one of the following laboratory results: a) a single high serologic titer in one or more specimens obtained after the onset of signs or b) the presence of *Chlamydiaceae* antigen (identified by enzyme-linked immunosorbent assay [ELISA], PCR, or FA) in feces, a cloacal swab, or respiratory or ocular exudates.

A suspected case of avian chlamydiosis is defined as a) compatible illness that is epidemiologically linked to another case in a human or bird but that is not laboratory confirmed, b) a subclinical infection with a single high serologic titer or detection of chlamydial antigen, c) compatible illness with positive results from a nonstandardized test or a new investigational test, or d) compatible illness that is responsive to appropriate therapy.

Avian diagnosis

Diagnosis of avian chlamydiosis can be difficult, especially in the absence of clinical signs. A single testing method might not be adequate. Therefore, use of a combination of culture, antibody- and antigen-detection methods is recommended, particularly when only one bird is tested. See Appendix A of the Compendium referenced in the first paragraph for details on the various testing procedures and a list of the laboratories that perform such testing.

The Animal Health Laboratory of the Virginia Department of Agriculture and Consumer Services performs an PCR test on cloacal swabs. They will also perform post mortems and evaluate tissue specimens by PCR and histopathology using special stains.